

CLAIMS:

1. A programmer for a medical device comprising:  
an internal antenna mounted within a programmer housing, wherein the internal antenna defines an aperture; and  
a battery bay that extends at least partially into the aperture.
  
2. The programmer of claim 1, wherein the battery bay is oriented such that batteries placed in the battery bay present a load to the internal antenna.
  
3. The programmer of claim 1, wherein the battery bay is oriented such that batteries placed in the battery bay present a load to enhance noise immunity of the internal antenna to external electromagnetic interference.
  
4. The programmer of claim 1, wherein the battery bay is sized to accommodate AAA batteries.
  
5. The programmer of claim 1, further comprising:  
a first housing member;  
a first circuit board within the first housing member;  
a second circuit board disposed over the first circuit board within the first housing member; and  
a second housing member disposed over the second circuit board to substantially enclose the first and second circuit boards, wherein the first housing member includes a molded area that defines the battery bay adjacent the first circuit board.
  
6. The programmer of claim 5, further comprising an access opening in the first housing member to gain access to the battery bay for placement of the batteries.
  
7. The programmer of claim 5, wherein the internal antenna is displaced from the first circuit board and coupled to the first circuit board via an antenna.

8. The programmer of claim 5, wherein the internal antenna is mounted to the first circuit board on a side of the first circuit board opposite the second circuit board, and a display is mounted to the second circuit board on a side of the second circuit board opposite the first circuit board.

9. The programmer of claim 8, wherein the first circuit board includes telemetry circuitry and the second circuit board includes control circuitry to control the display and the telemetry circuitry, the programmer further comprising an electrical interface between the first and second circuit boards.

10. The programmer of claim 9, wherein the control circuit disables the display and the display circuitry during telemetry via the internal antenna.

11. The programmer of claim 9, wherein the telemetry circuitry transmits signals to the implantable neurostimulator via the antenna and processes signals received from the implantable neurostimulator via the antenna.

12. The programmer of claim 9, wherein the display is a liquid crystal display.

13. The programmer of claim 1, further comprising an external antenna coupled to the programmer via a cable.

14. The programmer of claim 13, wherein the external antenna defines an aperture with a channel formed to hold a portion of an item of clothing associated with a patient and thereby hold the external antenna in a substantially fixed position relative to an implantable neurostimulator.

15. The programmer of claim 1, wherein the internal antenna comprises a plastic frame wound with conductive winding.

16. The programmer of claim 15, wherein the internal antenna comprises copper braid shielding substantially surrounding the plastic frame and the conductive winding.

17. The programmer of claim 1, wherein the internal antenna comprises a loop-like shape that defines the aperture.